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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,999	07/08/2003	Yoshinori Yamamoto	50212-511	6259
20277	7590	11/02/2005	EXAMINER	
MCDERMOTT WILL & EMERY LLP			ROJAS, OMAR R	
600 13TH STREET, N.W.			ART UNIT	
WASHINGTON, DC 20005-3096			PAPER NUMBER	
			2874	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/613,999

Applicant(s)

YAMAMOTO ET AL.

Examiner

Omar Rojas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 August 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-6, 8-13, 15-20, 22-27 and 29-32 is/are rejected.  
7) ☒ Claim(s) 7, 14, 21, 28 and 33 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on August 17, 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 08/17/2005.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☒ Other: Detailed Action.

## **DETAILED ACTION**

### ***Response to Amendment***

1. With regards to the amendment filed on August 17, 2005, all the requested changes to the claims have been entered. Claims 1-33 are pending.

### ***Information Disclosure Statement***

2. The prior art documents submitted by Applicant in the Information Disclosure Statement(s) filed on August 17, 2005 have all been considered and made of record (note the attached copy of form(s) PTO-1449).

### ***Drawings***

3. The drawings were received on August 17, 2005. These drawings are accepted.

### ***Response to Arguments***

4. Applicant's arguments filed August 17, 2005 have been fully considered but they are not persuasive.

Regarding claims 1, 3, and 4, in the last paragraph on page 14 of the response filed August 17, 2005, Applicant(s) assert "[t]he Examiner's rejection is improperly based upon the combination of the thickness of the embodiment shown in Figure 7 and the longitudinal and transversal length of a separate embodiment shown in Fig. 10 of the '542 application." The examiner respectfully disagrees with this statement because both of the embodiments shown in Figures 7 and 10 are, in fact, closely related. Both embodiments use 10 km of dispersion compensation fiber ("DCF"). See col. 6, lines 8-16 and col. 7, lines 21-41 of the '542 application. Both embodiments also require a bobbin having a cylinder diameter upon which the 10 km of DCF is wound. Id. Thus, the two embodiments are closely related and the Examiner

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did not merely "randomly pick out convenient parts from different embodiments of '542 application" as asserted by Applicant(s).

The embodiment disclosed in Figure 10 did not mention a thickness for the bobbin or housing. However, the embodiment shown in Figure 7 did recite a thickness of 18 mm for the bobbin (i.e., the "winding width k"). Because the two embodiments are closely related and share similar characteristics as mentioned, it was reasonable for the Examiner to use the thickness for the embodiment of Figure 7 in the embodiment of Figure 10, since the Figure 10 embodiment did not mention a specific thickness. Therefore, it was not improper for the Examiner to assume that the embodiment of Figure 10 shared the same or similar thickness to that of the embodiment of Figure 7.

Regarding the argument beginning in the last paragraph on page 15 of the response filed August 17, 2005, the Applicant(s) mention that "it is necessary to shorten a length of this DCF...and to wind this DCF at a smaller diameter." This statement is only partially correct. It would not be "necessary" to wind the DCF at a smaller diameter as asserted by Applicant(s). Instead, *a bobbin having a smaller width or thickness* could be used. U.S. Patent No. 4,998,003 to Kawanbe ("the '003 patent") teaches that the length *l* of a wire or cable that can be used with a particular bobbin is related to both the diameter and the width of the bobbin. See the '003 patent at col. 4, lines 17-50. The '003 patent is cited merely to support the examiner's assertion that a bobbin having a smaller width or thickness could be used, rather than a bobbin having a smaller diameter as asserted by Applicant(s). Thus, Applicants' arguments in the last paragraph on page 15 are based upon an incorrect assumption that a smaller diameter is necessary to achieve a volume of less than 500 cm<sup>3</sup>. Therefore, these arguments are unpersuasive.

Regarding Applicants' arguments concerning claims 3 and 4 on page 16 of the response, it is noted that the Patent Office is not funded or equipped to test connection losses or bending losses of prior art references. The '542 application teaches how to reduce bending losses and splicing losses in col. 9, lines 12-29 and in col. 10, lines 4-26. It is further noted that the Applicant(s) have not provided objective evidence of what the connection loss or bending loss would be in the dispersion compensator of the '542 application, but instead merely state that they "cannot be disregarded." In making the rejection of claims 3 and 4, the examiner relied upon the objective disclosure of the '542 application given in column 4, lines 1-14, concerning the transmission loss, wavelength, and chromatic dispersion. From that information, it was reasonable for the examiner to infer an insertion loss in the '542 application equivalent to that recited by claims 3 and 4. Thus, Applicants' arguments concerning claims 3 and 4 are unpersuasive.

Regarding the arguments concerning claims 8, 10, 11, 15, 17, 19, 22, 24, and 25, on pages 16-17 of the response, the Applicant(s) again incorrectly assume that a smaller diameter is necessary to reduce the volume of the housing (see remarks on the last line on page 16 and the first line on page 17 of the response). As mentioned above, a bobbin having a smaller width or thickness could instead be used to reduce the volume of the housing. On page 17, lines 1-3 of the response, the Applicant(s) appear to have taken the disclosure of the '542 application out of context. It is clear from col. 8, lines 41-46 of the '542 application that a bending loss of 1dB/m or more is not required by the '542 application, but merely optional. The Applicant(s) also discuss "micro-bending resistance", "MFD", and "effective area  $A_{eff}$ " on page 17 of the response, but none of these are limitations are mentioned in any of claims 8, 10, 11, 15, 17, 19,

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22, 24, or 25. Thus, Applicants' arguments concerning claims 8, 10, 11, 15, 17, 19, 22, 24, or 25 are also unpersuasive.

Regarding claims 2, 5, 6, 9, 12, 13, 16, 19, 20, 23, 26, 27, and 29-32, the Applicant(s) again mention "MFD", " $A_{eff}$ ", and "micro-bending resistance" in the arguments found on page 18, lines 1-4 of the response. The Examiner notes that "MFD", " $A_{eff}$ ", and "micro-bending resistance" are not limitations recited by any of the aforementioned claims. Regarding Applicant's argument on page 18, lines 5-16 of the response, the '428 application teaches that a "lower transmission loss" can be achieved by appropriately selecting the value of  $\Delta 1$ . See col. 5, lines 8-17 of the '428 application. Thus, even assuming *arguendo* that the DCF of the '428 application "is almost certain to have at least a transmission loss of 0.4 dB/km or more" as asserted by Applicant(s), this transmission loss can be lowered by simply selecting an appropriate value of  $\Delta 1$  as taught by the '428 application. Therefore, Applicants' arguments concerning claims 2, 5, 6, 9, 12, 13, 16, 19, 20, 23, 26, 27, and 29-32 are unpersuasive.

Because Applicants' arguments are unpersuasive for the reasons given above, the previous claim rejections in view of the '542 application, and the '542 application combined with the '428 application, are maintained and repeated below.

#### ***Terminal Disclaimer***

5. The terminal disclaimer filed on August 17, 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application No. 10/347,417 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Claim Rejections - 35 USC § 102/103***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**8. Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 1 063 542 A1 to Sumitomo Electric Industries (hereinafter “the '542 application”), provided by Applicant(s) in an Information Disclosure Statement.**

Regarding claim 1, the '542 application discloses a dispersion compensator, comprising: an optical fiber component having an accumulated chromatic dispersion of -1000 ps/nm at a wavelength of 1.55  $\mu\text{m}$  (see column 4, line 9-13 and column 7, lines 31-35); and a housing **80** having a minimum possible volume of  $18\text{mm} \times 210\text{mm} \times 130\text{mm} = 491400 \text{ mm}^3 = 491.4 \text{ cm}^3$  for accommodating 10km of said optical component (see column 6, lines 8-16 and column 7, lines 30-41). Although the '542 application does not expressly recite the volume of housing **80**, the dimensions indicated by the '542 application suggest a volume of less than  $500 \text{ cm}^3$  as mentioned

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above. Alternatively, it would be obvious to modify the housing 80 to have a volume less than 500 cm<sup>3</sup> since providing a smaller housing would save valuable space.

Regarding claim 3, see the previous remarks and column 4, lines 9-14 of the '542 application.

Regarding claim 4, the 10 km of dispersion compensating fiber ("DCF") disclosed by the '542 application satisfy the relationship of claim 4 with "IL" being equal to 4 dB and "AD" being equal to 1000 ps/nm. See the '542 application at column 4, lines 1-12.

**9. Claims 8, 10, 11, 15, 17, 18, 22, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '542 application as applied to claims 1, 3, and 4 above.**

Regarding claims 8, 10, 11, 15, 17, 18, 22, 24, and 25, the previous remarks concerning the '542 application are incorporated herein.

The '542 application differs from claims 8, 10, 11, 15, 17, 18, 22, 24, and 25 in that the '542 application does not expressly disclose the claimed accumulated dispersion ("AD"), insertion loss ("IL"), and housing volume(s) recited by claims 8, 10, 15, 22, and 24.

It is first noted that less than 1 km of the dispersion compensating fiber ("DCF") disclosed by the '542 application will satisfy all the claimed AD values of claims 8, 10, 15, 22, and 24. This is because 1 km of the DCF disclosed by the '542 application will have an AD equal to -100 ps/nm



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(1 km multiplied by -100/ps/nm/km equals -100 ps/nm). See the '542 application at column 4, lines 9-14. It is further noted that 1 km of the DCF disclosed by the '542 application will also have only 0.40 dB transmission loss (i.e., insertion loss), thereby satisfying claims 10, 11, 17, 18, 24, and 25. See the '542 application at column 4, lines 9-14.

Because 1 km is ten times less than the 10 km expressly taught by the '542 application (see column 6, lines 8-16), the volume of the housing 80 required to store the DCF can be made correspondingly smaller (i.e., 200 cm<sup>3</sup> or less). This could be achieved by simply reducing the thickness of the bobbin 2 since it would only need to hold 1 km of DCF in order to meet the claimed AD value(s).

The ordinary skilled artisan would have been motivated to select a smaller housing in the '542 application order to better accommodate a smaller length of DCF (i.e., in order to compensate for dispersion in a shorter length of single-mode optical fiber). See column 1, lines 11-18.

Therefore, the limitations of claims 8, 10, 11, 15, 17, 18, 22, 24, and 25 are considered obvious in view of the '542 application.

**10. Claims 2, 5, 6, 9, 12, 13, 16, 19, 20, 23, 26, 27, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '542 application as applied to claims 1, 3, 4, 8, 10, 11, 15, 17, 18, 22, 24, and 25 above, and further in view of EP 1 130 428 A1 (hereinafter “the '428 application”), also provided by Applicant(s).**

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Regarding claims 2, 5, 6, 9, 12, 13, 16, 19, 20, 23, 26, 27, and 29-32, the previous remarks concerning the '542 application are incorporated herein. As mentioned above, the '542 application teaches providing a certain length of dispersion compensating fiber (“DCF”) within a housing having a given volume.

The '542 application further differs from claims 5, 6, 12, 13, 19, 20, 26, and 27 in that the '542 application does not teach a DCF having the triple cladding structure and bending loss recited by these claims.

However, the '428 application reference teaches a DCF having the same triple cladding structure (see Figures 1A-1B) and the same bending loss as recited by claims 5, 6, 12, 13, 19, 20, 26, and 27. See the '428 application at paragraph [0048]-[0049].

The motivation for combining both references is given by the '428 application in paragraph [0073]: “[a]s a result, when the dispersion compensating fiber is wound like a coil so as to construct a module, the latter can be made smaller.” In other words, the DCF disclosed by the '428 application can be used in applications requiring smaller housing modules.

Therefore, the limitations of claims 5, 6, 12, 13, 19, 20, 26, and 27 are considered obvious in view of the '542 application combined with the '428 application.

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Regarding claims 2, 9, 16, 23, and 29-32, when the DCF of the '428 application is combined with a housing structure similar to that disclosed by the '542 application, the relationship between the accumulated chromatic dispersion ("AD") and the volume of the housing would inherently satisfy the mathematical relationship recited by claims 2, 9, 16, 23, and 29. This is because the claimed mathematical relationship is based upon using a DCF having characteristics identical to the DCF disclosed by the '428 application.

Therefore, claims 2, 9, 16, 23, and 29-32 are also considered obvious in view of the '542 application combined with the '428 application.

#### ***Allowable Subject Matter***

11. Claims 7, 14, 21, 28, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: Regarding claims 7, 14, 21, 28, and 33, the primary reason for allowance of the claims is the inclusion of a second cladding part having a relative refractive index difference of 0.2% to 0.9% with respect to the third cladding. This feature is simply not taught or suggested by any of the prior art references cited above.

#### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patent No. 6,400,877 B1 discloses a DCF having a triple cladding structure and reduced bending losses ideal for use in a small volume housing.

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14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

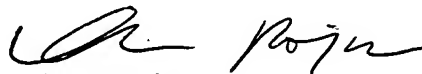
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar Rojas whose telephone number is (571) 272-2357. The examiner can normally be reached on Monday-Friday (12:00PM-8:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick, can be reached on (571) 272-2344. The official facsimile number for regular and After Final communications is (571) 273-8300. The examiner's RightFAX number is (571) 273-2357.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Omar Rojas  
Patent Examiner  
Art Unit 2874

or  
October 21, 2005



Sung Pak  
Primary Examiner  
AU 2874